CLAIMS

[1] A direct current (DC) braking method for stopping an induction motor,

the method using a control device including: a power converter for driving the induction motor, a PWM arithmetic unit for determining a switching pattern of the power converter on the basis of a primary voltage instruction and an output phase obtained by adding a voltage phase and a magnetic flux phase, a voltage arithmetic unit, a torque current controller and an excitation current controller, wherein

torque shock generated by an abrupt change of an output current phase is reduced to a predetermined value or less by predictably operating an output voltage phase during the DC braking on the basis of an output voltage phase of a normal control state, when a switch-over from the normal control state to a DC braking state is performed.

[2] The DC braking method according to claim 1, wherein

the output voltage phase during the DC braking is predictably operated on the basis of an output voltage phase of the normal control state and a

phase advanced until the DC braking is initiated.

[3] The DC braking method according to claim 2, wherein

the phase advanced until the DC braking is initiated is operated on the basis of a setup DC braking initiation frequency.

[4] The DC braking method according to claim 2, wherein

the phase advanced until the DC braking is initiated is operated on the basis of a deceleration rate and a setup DC braking initiation frequency.

[5] The DC braking method according to claims 1 to 4, wherein

the torque shock during a restart is reduced to a predetermined value or less by controlling the output voltage phase during the DC braking with respect to a coordinate axis for a normal control.

[6] A control device capable of a DC braking for stopping an induction motor,

the control device comprising:

a power converter for driving the induction

motor;

a PWM arithmetic unit for determining a switching pattern of the power converter on the basis of a primary voltage instruction and an output phase obtained by adding a voltage phase and a magnetic flux phase;

a voltage arithmetic unit;

a torque current controller; and

an excitation voltage controller, wherein

torque shock generated by an abrupt change of an output current phase is reduced to a predetermined value or less by predictably operating an output voltage phase during the DC braking on the basis of an output voltage phase of a normal control state, when a switch-over from the normal control state to a DC braking state is performed.

[7] The control device according to claim 6, wherein

the output voltage phase during the DC braking is predictably operated on the basis of an output voltage phase of the normal control state and a phase advanced until the DC braking is initiated.

[8] The control device according to claim 7,

wherein

the phase advanced until the DC braking is initiated is operated on the basis of a setup DC braking initiation frequency.

[9] The control device according to claim 7, wherein

the phase advanced until the DC braking is initiated is operated on the basis of a deceleration rate and a setup DC braking initiation frequency.

[10] The control device according to claims 6 to 9, wherein

the torque shock during a restart is reduced to a predetermined value or less by controlling the output voltage phase during the DC braking with respect to a coordinate axis for a normal control.